



# Abuse of Antibiotics in Viral and Other Infections as a Reason for Resistance in Republic of Northern Macedonia

Olumchev S<sup>1\*</sup>, Olumcheva M<sup>2</sup>

<sup>1</sup>Department of Epidemiology, PHI Center for Public Health Veles PE Gevgelija, Bogdanci, Southeastern, North Macedonia

<sup>2</sup>Department of Psychology, PHI Center for Public Health Veles PE Gevgelija, Bogdanci, Southeastern, North Macedonia

## ABSTRACT

Antibiotics are important drugs. Infections caused by bacteria (bacterial infections) can be successfully treated with antibiotics. Antibiotics can prevent the spread of the disease; also antibiotics can reduce the serious complications of the disease and prevent death as a possible course of the disease. But many antibiotics that used to be "typical" in treating bacterial infections are now ineffective or less effective. Antibiotic resistance is one of the most serious health problems in the world that requires immediate solution.

**Keywords:** Antibiotics; Bacterial infections; Antimicrobial; Antibiotic resistance; Immediate solution

## INTRODUCTION

Antibiotics are important drugs. Infections caused by bacteria (bacterial infections) can be successfully treated with antibiotics. Antibiotics can prevent the spread of the disease; also antibiotics can reduce the serious complications of the disease and prevent death as a possible course of the disease. But many antibiotics that used to be "typical" in treating bacterial infections are now ineffective or less effective. Some drugs do not work against some bacteria at all. When an antibiotic no longer works against certain types of bacteria, those bacteria are said to be resistant or "resistant" to antibiotics. Antibiotic resistance is one of the most serious health problems in the world that requires immediate solution. Overuse and misuse of antibiotics are key factors that lead to the general public, health care providers and hospitals can help ensure proper use. The ban on the free sale of antibiotics on the market in the republic of Northern Macedonia, which emphasizes their abuse, is one of the

leading problems in establishing resistance to antibiotics in general of them, especially after their overuse in coronavirus infections in the last two years. Bacteria resist the drug by changing them. The change may protect the bacteria from the effects of the drug or limit the drug's access to the bacteria. Bacteria that survive antibiotic treatment can multiply and pass on antibiotic resistance by genetically transferring that information to future generations. Also, some bacteria can transmit their drug resistant properties to other bacteria. This is like exchanging tips and information to help each other in the struggle for survival. The fact that bacteria develop drug resistance is normal and expected. But the way drugs are used affects how quickly and to what extent resistance occurs. The rapid emergence of resistant bacteria is occurring worldwide, jeopardizing the effectiveness of antibiotics, which have revolutionized the treatment of bacterial infections and saved millions of lives. Many decades after the first patients were treated with antibiotics; bacterial infections again became a serious threat. The "crisis" in treatment as a result of

<b>Received:</b>	12-April-2022	<b>Manuscript No:</b>	IPJDA-22-12975
<b>Editor assigned:</b>	14-April-2022	<b>PreQC No:</b>	IPJDA-22-12975 (PQ);
<b>Reviewed:</b>	28-April-2022	<b>QC No:</b>	IPJDA-22-12975
<b>Revised:</b>	10-October-2022	<b>Manuscript No:</b>	IPJDA-22-12975 (R)
<b>Published:</b>	17-October-2022	<b>DOI:</b>	10.36648/2471-853X.22.8.12.131

**Corresponding author** Olumchev S, Department of Epidemiology, PHI Center for Public Health Veles PE Gevgelija, Bogdanci, Southeastern, North Macedonia; E-mail: olumcevs@yahoo.com

**Citation** Olumchev S, Olumcheva M (2022) Abuse of Antibiotics in Viral and Other Infections as a Reason for Resistance in Republic of Northern Macedonia. J Drug Abuse. 8:131

**Copyright** © 2022 Olumchev S, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

developing resistance to available antibiotics is attributed to the overuse and abuse of these drugs, as well as the lack of development of new drugs by the pharmaceutical industry due to reduced economic incentives and challenging regulatory requirements. The Centers for Disease Control and prevention (CDC) has classified large numbers of bacteria as urgent, serious, and worrying threats, many of which are already responsible for placing significant clinical and financial burden on the health care system, patients, and their families due to developed antibiotic resistance. Which increases the number of hospital days that burden the budget of the individual and the state? Coordinated efforts are needed to implement new policies, renew research efforts, coordinate and share the latest knowledge in order to successfully manage the crisis. One of the mechanisms is strict control of the prescription and sale of antibiotics on the pharmaceutical market which is one of the most profitable. If an antibiotic is taken when there is a viral infection, the antibiotic attacks the bacteria in the body. These are bacteria that are beneficial or do not cause disease, the so called "normal flora". This incorrect and inadequate treatment can then promote and develop antibiotic resistance properties in harmless and beneficial bacteria in the human body, which can be shared with other bacteria which creates a real opportunity to replace potentially harmful bacteria as harmless as a result of acquired resistance to antibiotics that allow them to multiply smoothly. Antimicrobial Resistance (AMR) poses a major threat to human health worldwide. Previous publications have evaluated the effect of AMR on incidence, deaths, length of hospital stay, and health care costs for specific pathogen combinations at specific locations. To the best of our knowledge, this study presents the most comprehensive Antimicrobial Resistance (AMR) load assessments to date. Antibiotic resistance is a global public health crisis. Reducing the incidence of infections due to the resistance of pathogens to available drugs is crucial and is a top priority of the World Health Organization (WHO), the pharmaceutical industry and should be a priority in all national health agendas. The main driver of drug resistance is the misuse of antibiotics, which is widespread throughout the world. Abuse contributes to the spread of Multidrug Resistant Organisms (MDROs); such as MRSA. MDRO induced infections result in longer hospital stays and increased morbidity and mortality. At least 23,000 people die from MDRO infections in the United States each year. However, the burden in low and middle income countries is estimated to be three times higher per patient's hospital day. Patients themselves are key participants in the decision to treat the disease with antibiotics. Thus, the self-belief treatment enabled by the free sale of antibiotics in the Republic of Northern Macedonia contributes to the inappropriate "abuse" of antibiotics by patients, which is crucial for the development of resistance to them. Access to health care for almost 70% of the population of Northern Macedonia living in the countryside is a greater challenge than in the cities. Understanding the patient-donor relationship and its role in antibiotic use is particularly crucial in poorly studied areas with limited access to health care. We hypothesized that patients with lower access to health care, health knowledge, and lower incomes would be less likely to

seek health care from an allopathic physician and that this would lead to greater antibiotic abuse due to the easy purchase of over the counter antibiotics. Thus, we conducted a qualitative study to assess the social determinants of antibiotic use among community members in rural Macedonia.

## LITERATURE REVIEW

We conducted a qualitative study on the social determinants of antibiotic use among community members in northern Macedonia to investigate how access to health care, health knowledge, and income influence patient's antibiotic use practices. The study included semi structured interviews and a cross sectional survey. The interview data and the survey of twenty participants were collected in July and August 2021 [1-3]. This study was embedded in a larger study with mixed methods of abusing and dispensing antibiotics among community members and health professionals. A sample size of twenty interviews was finalized based on theoretical saturation. Theoretical saturation is the standard method for determining sample size in qualitative studies [4]. Using this method, the required saturation was achieved and the interview was interrupted when the interview responses became repetitive, so that little new material or analytical topics were collected from the additional interviews. Fifteen community members were recruited by adequate sampling at local pharmacies, with the approval of the pharmacist or store owner [5,6].

To achieve theoretical saturation, five more people were recruited from nearby locations and food stalls along the roads. In this study, we used the terms antibiotic abuse and inappropriate use interchangeably. These terms were used to describe the following practices:

- Purchase of an incomplete dose of medicine that is lower than the one prescribed by an allopathic doctor.
- Discontinue antibiotic treatment before completing all doses.
- Taking old antibiotics that were previously purchased to treat another disease, or
- Buying and taking antibiotics without a prescription from an allopathic doctor.
- We categorized the first two practices as shortened courses with antibiotics, and the second two as overuse of antibiotics.

## RESULTS AND DISCUSSION

Approximately half of the community members stated that they had learned something about health topics in school or through a community program (8/17, 52.9%; not rated by three participants). These classes were usually taken in primary school and focused on hand hygiene and general cleanliness. In general, participants had minimal understanding of antibiotics and antibiotic resistance. According to the survey, most participants had heard the term antibiotic before (16/20; 80%), but no one could give a

complete answer to the following open ended question: Give your best definition of antibiotics. Give your best definition of antibiotics. Several responded that antibiotics cure diseases, but do not distinguish between infectious and other diseases. Participants were also largely unaware of the negative effects of antibiotic abuse and described this class of drugs as a type of magic bullet that cures all diseases and does not harm them. In the study, less than half of the participants said that antibiotics could stop working if taken more than once (45%, 9/20). Our findings show that social factors such as income levels and access to health care are related to antibiotic use practices. Antibiotics and the implications of their abuse were poorly understood by the participants. The low basic level of knowledge about antibiotics was consistent in a range of educational attainment and health learning experiences at school. In the study, more than half of the participants stated that it was appropriate to discontinue antibiotics after relief of symptoms (65%). Although the populations surveyed are not comparable, it is important to note that 65% is much higher than the 37% found in a recent WHO study on antibiotic use as in our study, low income populations are particularly likely to support early cessation of antibiotic treatment. This may be due in part to the interaction between income and knowledge about antibiotics. If patients come from a low income group and are unaware of the dangers of early discontinuation, it is a logical economic decision to stop taking antibiotics once the symptoms have disappeared. The introduction of new antibiotics has outpaced the development of antibiotic resistance. In recent years, however, the pace of drug resistance has led to a growing number of health problems. More than 2.8 million infections with antibiotic resistant bacteria occur in the United States each year, resulting in 35,000 deaths. Other results we got from our research on drug-resistant infections include:

- Severe illness.
- Longer recovery.
- More frequent or prolonged hospitalizations.
- More visits to health care providers.
- More expensive treatments.
- Increased number of complications.

## CONCLUSION

Antibiotics are drugs that fight bacterial infections. Used properly, they can save lives. But there is a growing problem with antibiotic resistance. It occurs when bacteria change and counteract the effects of an antibiotic. Resistant bacteria can continue to grow and multiply. Every time antibiotics are taken there is a risk that the bacteria will become resistant. Resistant bacteria cause infections that can be severe and sometimes impossible to cure and can be fatal. They can be passed on to other people. They can be passed on to other people. Antibiotics are used to kill bacteria that can cause a variety of diseases and prevent them from spreading. They have made a major contribution to human health as one of the most effective weapons in the fight against infections. Many diseases that once killed people can now be effectively

treated with antibiotics. However, some bacteria have become resistant to commonly used antibiotics. Antibiotic resistant bacteria are bacteria that are not controlled or destroyed by antibiotics. They are able to survive and even reproduce in the presence of an antibiotic. Most bacteria that cause infections can become resistant to at least some antibiotics. Bacteria that are resistant to many antibiotics are known as Multidrug Resistant Organisms (MROs). Antibiotic resistance is a serious public health problem. It can be prevented by minimizing unnecessary prescription and purchase of antibiotics, proper use of prescribed antibiotics and good hygiene and infection control. Some bacteria are naturally resistant to some antibiotics. Antibiotic abuse results in antibiotic resistant bacteria that can cause severe infections and even death. Everyone (childcare staff, teachers, school nurses, parents/guardians, health care providers and the community) has a role to play in preventing antibiotic abuse. Our study found that many members of the rural community in the former Yugoslav republic of Macedonia have limited access to health care, minimal understanding of proper antibiotic practices, and living in poor economic conditions. The widespread abuse of antibiotics among these members of the community reinforces the importance of conducting research to develop effective strategies to stem the tide of antibiotic resistance in villages in the republic of Northern Macedonia.

## REFERENCES

1. Alili Idrizi E, Dauti M, Malaj L (2014) Validation of the parental knowledge and attitude towards antibiotic usage and resistance among children in Tetovo, the Republic of Macedonia. *Pharm Pract.* 12(4):460-467.
2. WHO (2020) Promoting appropriate use of antibiotics in hospitals to contain antibiotic resistance in North Macedonia. World Health Organization.
3. Gualano MR, Gili R, Scaioli G, Bert F, Siliquini R (2015) General population's knowledge and attitudes about antibiotics: a systematic review and meta-analysis. *Pharmacoepidemiol Drug Saf.* 24(1):2-10.
4. Alili-Idrizi E, Dauti M, Malaj L, (2014) Validation of the parental knowledge and attitude towards antibiotic usage and resistance among children in Tetovo, the Republic of Macedonia. *Pharmacy Practice.* 12(4):1-7.
5. Wall S (2019) Prevention of antibiotic resistance an epidemiological scoping review to identify research categories and knowledge gaps. *Global Health Action.* 12(1):1756191.
6. Sun R, Yao T, Zhou X, Harbarth S, Lin L (2021) Non biomedical factors affecting antibiotic use in the community: a mixed methods systematic review and meta analysis. *Clin Microbiol Infect.* 8(3):345-354.